

NAVAL POSTGRADUATE SCHOOL
Monterey, California



THESIS

**TACTICAL SIGNALS INTELLIGENCE
IN MARINE FORCES PACIFIC:
BUILDING THE NEW
FIRST RADIO BATTALION**

by

Scott A. Westerfield

December 2000

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BUILDING THE NEW FIRST RADIO BATTALION**

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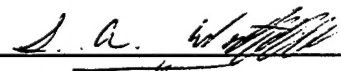
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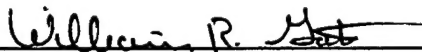
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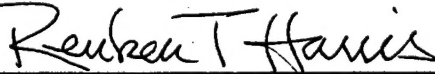
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ABSTRACT

The reorganization and relocation of First Radio Battalion by Headquarters Marine Corps (HQMC) and Marine Forces Pacific presents a number of logistical and fiscal challenges to coordinate moving manpower and equipment over thousands of miles. As a former member of First Radio Battalion, I have attempted to document and seek solutions to the operational difficulties that have beset the battalion for over 25 years.

First, the battalion's existing tables of organization and equipment have been modified, given the limitations of current structure and expected future operational requirements. Next, the modified tables have been produced as appendices to the thesis to document the finished results. Finally, costs were estimated for personnel transfer and vehicle shipment using the Crystal Ball Microsoft EXCEL spreadsheet add-in. The resulting analyses yield recommendations for relocating and reorganizing the battalion at Camp Pendleton.

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TABLE OF CONTENTS

I. INTRODUCTION.....	1
A. PURPOSE OF THESIS/STATEMENT OF PROBLEM	1
B. SCOPE.....	2
C. METHODOLOGY.....	2
II. FIRST RADIO BATTALION: AN OVERVIEW.....	5
A. INTRODUCTION.....	5
B. WHAT IS FIRST RADIO BATTALION?.....	5
C. FIRST RADIO BATTALION: PROBLEMS AND SOLUTIONS.....	7
D. ORGANIZATIONAL THEORY AND THE RADIO BATTALION PROBLEM.....	10
E. COMMAND RELATIONSHIPS WITHIN THE MARINE FORCES.....	14
F. CONCLUSION.....	17
III. BUILDING THE BATTALION.....	19
A. INTRODUCTION.....	19
B. WHAT ARE THE TABLES OF ORGANIZATION AND EQUIPMENT?.....	20
C. REVISING THE TABLE OF ORGANIZATION (PERSONNEL).....	23
D. REVISING THE TABLE OF EQUIPMENT.....	27
E. METHODOLOGY BEHIND DRAFTING THE NEW T/O AND T/E.....	28
IV. MOVING THE BATTALION.....	31
A. INTRODUCTION.....	31
B. A WORD ABOUT THE SIMULATION: PROGRAM AND INPUTS.....	31
C. COST OF RELOCATION (PERSONNEL).....	33
D. COST OF RELOCATION (VEHICLES).....	38
V. CONCLUSION.....	43
A. SUMMARY.....	43
B. RESULTS OF STUDY.....	45
LIST OF REFERENCES.....	47
APPENDIX A. BATTALION TABLE OF ORGANIZATION (CAMP PENDLETON).....	49
APPENDIX B. BATTALION TABLE OF EQUIPMENT (CAMP PENDLETON).....	57
APPENDIX C. RELOCATION OF PERSONNEL (OFFICERS/ENLISTED).....	71
APPENDIX D. SHIPPING AND TRANSPORTATION OF VEHICLES.....	77
INITIAL DISTRIBUTION LIST.....	83

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LIST OF FIGURES

FIGURE 2.1.	MARINE FORCES ATLANTIC.....	16
FIGURE 2.2.	MARINE FORCES PACIFIC.....	16
FIGURE 3.1.	U.S. MARINE CORPS TABLE OF ORGANIZATION.....	20
FIGURE 3.2.	U.S. MARINE CORPS TABLE OF EQUIPMENT.....	22
FIGURE 4.1.	SIMULATION RESULTS FOR PERSONNEL TRANSFER.....	37
FIGURE 4.2.	PROBABILISTIC RANGE OF VALUES FOR PCS PERSONNEL TRANSFER (CY04\$).....	38
FIGURE 4.3.	FIRST RADIO BATTALION VEHICLES: RATES BY CATEGORY.....	40
FIGURE 4.4.	PROBABILISTIC RANGE OF VALUES FOR VEHICLE SHIPPING AND TRANSPORTATION COSTS (CY00\$).....	42
FIGURE 5.1.	SUMMARY OF COSTS FOR PERSONNEL TRANSFER AND VEHICLE SHIPMENT IN FISCAL YEAR 2004.....	46

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I. INTRODUCTION

A. PURPOSE OF THESIS/STATEMENT OF PROBLEM

This thesis discusses and analyzes the planned relocation and reorganization of First Radio Battalion from its current home (Marine Corps Base Kaneohe Bay, Hawaii) to Camp Pendleton, California. The Commandant of the Marine Corps has recently approved the relocation of First Radio Battalion to the First Marine Expeditionary Force (I MEF), concurrent with creating the Third Radio Battalion to care for the Third Marine Expeditionary Force (III MEF). This thesis focuses only on First Radio Battalion.

My objective in writing this thesis is to provide a comprehensive quantitative and qualitative analysis to support senior level decision-makers at Marine Forces Pacific (MARFORPAC) and Headquarters Marine Corps (HQMC) in executing this move. Research focuses on planned budget allocations and expenditures, key required planning and operational events, and reorganization of the battalion from its current size to a smaller unit tailored to the needs of I MEF.

B. SCOPE

The scope of the thesis includes:

- Review the battalion's current missions and functions in support of I MEF (including major subordinate commands, exercises and operations)
- Draft new Tables of Organization and Equipment for the battalion to reflect its mix of personnel and gear post-relocation
- Identify relevant costs associated with the relocation

The thesis concludes by summarizing relevant costs of relocation and drafting a revised battalion structure (personnel and equipment).

C. METHODOLOGY

My initial thesis research and analysis reviewed the Marine Corps doctrinal publication that was most relevant to the issue at hand, Marine Corps Warfighting Publication (MCWP) 2-15.2, SIGNALS INTELLIGENCE. This publication is detailed in its description of the radio battalions'

mission, organization and employment, including the location of First and Second Radio Battalions under their respective Marine Forces command.

Other publications included two articles from the Marine Corps Gazette that discuss Radio Battalion operations, including the employment of the MEU detachments. The final step in the thesis research involved reviewing the official First Radio Battalion history from the Marine Corps Base Hawaii website. This website included information on battalion standard operating procedures and operational deployment history.

The crux of this thesis lies in preparing three specific deliverable items for HQMC (Director of Intelligence), the executive office planning the battalion's relocation. To support these deliverables, the research was completed in two stages: constructing tables of organization and equipment to support the move and estimating the moving costs for associated personnel and equipment.

For the tables of organization and equipment (T/O and T/E), the Marine Corps Combat Development Command (MCCDC) website was a primary reference point. Personal interviews were also conducted with MCCDC personnel to better understand the T/O and T/E process, including how to build and prepare the tables. For estimating the cost to relocate

equipment, historical budget data was gathered while on a research visit to First Radio Battalion. This data provided the primary inputs for Crystal Ball, a Microsoft EXCEL simulation spreadsheet add-in. The simulation provided rough estimates of shipping and transportation costs. Finally, for estimating the cost to relocate personnel, the bottom-line cost reflects the standard rates HQMC uses for moving people to the continental United States (CONUS), adjusted for inflation.

II. FIRST RADIO BATTALION: AN OVERVIEW

A. INTRODUCTION

To make the thesis understandable to the general reader, it is important to discuss First Radio Battalion in terms of mission, scope of operations and unit history. This chapter accomplishes this by first describing the battalion and providing a brief précis of its history. Next, the operational problem facing the battalion and the rationale behind relocation and reorganization are discussed. This section includes the battalion's mission statement, while a separate section tackles the battalion's placement in the Marine Forces Pacific hierarchy, contrasted with Marine Forces Atlantic.

Finally, to better understand the battalion's operational problem, particular tenets of organizational theory and their relevance to the thesis as well as the battalion's problem concludes the chapter.

B. WHAT IS FIRST RADIO BATTALION?

As the primary source of tactical signals intelligence (SIGINT) support to Commander Marine Forces Pacific and his

subordinate commanders, First Radio Battalion supports two Marine Expeditionary Forces (MEF) and four Marine Expeditionary Units (MEU) on a constant basis. The battalion's area of responsibility includes the entire scope of U.S. Pacific Command (PACOM), Central Command (CENTCOM) and portions of Southern Command (SOUTHCOM), namely the Pacific coasts and littorals of Central and South America.

According to the official history of First Radio Battalion as provided on their official website, the unit first stood duty during World War II as a nascent grouping of radio intelligence platoons in San Diego. Deployed in the Central Pacific "island hopping" campaign, the radio intelligence platoons were deactivated in Pearl Harbor, Hawaii, following the war's end and the ensuing reduction in forces.

In 1958, the platoons were resurrected as First Radio Company, and activated in Camp H. M. Smith, Hawaii, prior to relocating to their present home at Kaneohe Bay. Redesignated First Radio Battalion in July 1964, the unit deployed both to the Republic of South Vietnam and Saudi Arabia (Operation Desert Shield/Desert Storm).

First Radio Battalion is one of three components of the Marine Corps signals intelligence organization:

- Tactical ground-based units (First and Second Radio Battalions)
- Tactical aviation units (electronic warfare (VMAQ) squadrons based at Marine Corps Air Station Cherry Point, North Carolina)
- Strategic and operational level (Marine Support Battalion headquartered at the National Security Agency, Fort Meade, Maryland, with subordinate companies collocated with NSA field sites worldwide)

C. FIRST RADIO BATTALION: PROBLEMS AND SOLUTIONS

What is the mission of First Radio Battalion? As stated in MCWP 2-15.2, SIGNALS INTELLIGENCE, "(t)he mission of the radio battalions is to provide communications security (COMSEC) monitoring, tactical SIGINT, electronic warfare (EW) and special intelligence (SI) communications support to the Marine Air-Ground Task Force (MAGTF)."

The specific and unclassified mission statement for First Radio Battalion, as provided on their official website, currently reads, "to provide tactical SIGINT/EW, communications security monitoring and SI Communications support to Commander Marine Forces Pacific and his major subordinate commanders." (<http://www.mcbh.usmc.mil/>)

1stradbn/history.htm) The major subordinate commanders specifically referenced in this statement are the commanding generals of I and III MEF, including all of the commands under their cognizance.

During its existence as both a company and battalion, the unit has been under the direct operational and administrative command and control of Fleet Marine Forces Pacific, now Marine Forces Pacific. Over time and with the evolution of the MEFs and the MEUs, First Radio Battalion's primary intelligence support mission has grown to include these organizations as well.

Due to its physical location and immediate subordination to Marine Forces Pacific, First Radio Battalion is the sole source of tactical SIGINT support for all Marine Corps forces in the entire Pacific theater of operations. As the only SIGINT player in the region, First Radio Battalion participation is expected by I and III MEF in their contingency and crisis plans. These plans include, but are not limited to, involvement with III MEF in the Korean theater and support to I MEF in defending the Arabian Gulf, should events dictate.

The battalion also supports the training and deployments of each MEU in the Pacific region - three on the West Coast at Camp Pendleton, California, and one in

Okinawa. Finally, there are a large number of exercises and miscellaneous training activities in which the battalion participates and supports, not only in Hawaii but on the West Coast and in Okinawa as well.

The difficulty of supporting the needs of three commanding generals and four MEU commanding officers on a constant basis, in addition to planning and preparing for wartime contingency operations with these units, has been a regular routine for the battalion since MEUs first began deploying in the region in 1974. This routine is complicated by the battalion's geographical isolation in the central Pacific Ocean.

The breakneck pace of the operational and personnel tempo places a corresponding strain on the human resources of First Radio Battalion. Family troubles and alcohol abuse problems are endemic to deploying Marine units, and are equally evident in this battalion. During my own tenure there from 1997 to 1999, five of the 24 officers assigned to the battalion divorced their spouses; a less dramatic ratio of enlisted Marines suffered the same personal trauma. Reenlistments were difficult also, with Marines opting for civilian life even when offered bonuses up to \$25,000 or more.

Non-human resources, such as vehicles and electronic equipment, appear to this writer to be highly overworked in the battalion as well. Some of the more unique assets, such as HMMWVs and certain electronic items, often were rotated from deployment to deployment with little to no time for necessary maintenance and repair.

The problem is simple enough to state: First Radio Battalion is a command with too broad a mission and too few people and equipment to easily accomplish its required activities. Although it regularly succeeds in accomplishing its mission, it does so at huge fiscal and morale expense.

D. ORGANIZATIONAL THEORY AND THE RADIO BATTALION PROBLEM

Several tenets of organizational theory are pertinent to the operational problem of First Radio Battalion, but the most relevant are the frames of reference.

To begin with, the frames of reference (as defined by Newcomb) are "an interrelated set of ideas that serve as a guide or basis for interpreting particular phenomena." The frames serve as guides to "size up" objects, events or situations in relation to something else, e.g., they enable us to understand a particular organization based on our perceptions.

According to Lee G. Bolman and Terrence E. Deal, the rational/structural frame posits that organizations exist primarily to accomplish goals and missions, and that organizations work best when uncertainty and personal preferences are subjugated to the norms of rationality in service of the organization. However, the human resources frame argues to the contrary that organizations must exist to serve human needs and require a synergy between organizations and people. The human resources frame also states that when the fit between organizations and individuals is bad, one or both will suffer.

As has been established by Bolman and Deal's work, conflict and disharmony are inevitable results of a lack of fit between the frames of reference. Scott, in his study on open systems, makes note of the danger in an organization's focus on structure and processes at the expense of monitoring its environment. He identifies the environment, as noted by Selznick, as a source of pressures and problems with which the organization must cope in order to survive, much less thrive.

Based on personal observation, the organization's focus has been solely fixated on mission accomplishment vice tending to the needs and morale of individuals (with rare exceptions, e.g., emergency leave, pending divorce, etc.).

Deployments in First Radio Battalion range from 30-day schools, such as airborne school or survival training, to one year with a Camp Pendleton-based MEU.

In addition to the varying duration of deployments, an individual Marine's personnel tempo may vary according to their job skills or proficiency in their assigned MOS. Arabic linguists may find themselves "double-pumping" with a Camp Pendleton-based MEU because those units spend an inordinate amount of time in the Arabian Gulf region, while the more senior enlisted Marines are often tasked to take charge of detachments within days of returning from a previous trip.

In making these observations, I should rightly point out that the individual battalion commanders are by no means at fault in this situation. First Radio Battalion's operational problem has been rooted in the position it occupies within the command hierarchy of MARFORPAC, and from this fact is born the necessity of supporting the two MEFs.

Former members of the battalion have drawn conclusions similar to mine vis a vis the battalion's personnel and operational tempo. Captain Matt Worsham, who served at various times as a platoon and company commander from 1997 to 2000, personally recommends the battalion's relocation and further elaborates that location is the primary factor

in the battalion's current human resource woes. Captain Worsham also states, and I concur, that "most deploying Marines ... spend less than half of their PCS tour physically on Oahu."

It has already been established that the battalion is spread thin because of high operational tempo and overcommitment due to the battalion's position in the MARFORPAC hierarchy. In addition to its position in the command structure, First Radio Battalion's operational problem is compounded by its geographic location in Hawaii, particularly when a large share of its operations are conducted in support of I MEF.

How is this problem to be resolved? The Commandant of the Marine Corps, as recorded in the official minutes of an executive off-site meeting in January 2000, made his decision as follows:

Issue: Pacific Radio Battalion

Discussion: DCMC, PP&O briefed proposals for relocating/reorganizing 1st RadBn. 1st RadBn's location in Hawaii handicaps its ability to support I MEF and III MEF planning, operations, and exercises.

CMC Decision: The conferees agreed the unit should be divided into two smaller battalions *without an increase in structure* (italics added). The new, smaller 1st RadBn will relocate to Southern California. A decision must be reached concerning the best location for the new 3d Radio Bn. Options include Southern California and Hawaii.

This obvious, although controversial, option is now an articulated executive decision: divide the present Pacific radio battalion into requisite sized units (according to the operational commitments of the MEF supported) and move the larger of the two units to southern California where more than half of the battalion's commitments are centered. The Commandant of the Marine Corps has recently mandated relocation of First Radio Battalion to Camp Pendleton, with a new organization (Third Radio Battalion) to support MARFORPAC/III MEF. This decision still is fraught with budgetary, operational and political complexities.

Although the battalion's difficulties have been framed from a human resources perspective, the remainder of the thesis will remain in a rational systems frame, because the creation of the new First Radio Battalion is strictly a question of resource allocation, both in terms of manpower and equipment.

E. COMMAND RELATIONSHIPS WITHIN THE MARINE FORCES

As pictured below in figures 2.1 and 2.2, the command relationships between the two existing radio battalions and their higher echelons are quite different. This difference is reflected in the operational and administrative placement

of the radio battalions in the organizational hierarchy of Marine Forces Pacific and Atlantic, respectively.

These figures illustrate the difference between the two existing radio battalions, and the root of the problem for First Radio Battalion: Marine Forces Atlantic (located in Norfolk, Virginia) is charged with responsibility for the Atlantic and Mediterranean areas, with only one major command element (II MEF) immediately subordinate to it. II MEF, in turn, has claim to tactical SIGINT support from Second Radio Battalion located in Camp Lejeune, North Carolina. This means that Second Radio Battalion supports only one Marine Expeditionary Force command and the three MEUs under its charge, a far lighter load than that presently shouldered by its sister battalion in the Pacific.

Within Marine Forces Pacific, First Radio Battalion has been directly subordinated to the Marine Forces commander at Camp Smith. This leaves the Pacific radio battalion responsible to a commander who is an entire echelon above that of its sister battalion on the east coast. While this is not itself a problem, its position in the hierarchy also requires the Pacific radio battalion, in its current configuration, to support two MEFs and four MEUs, and other exercises as designated, in a significantly larger geographic region than its sister battalion to the east.

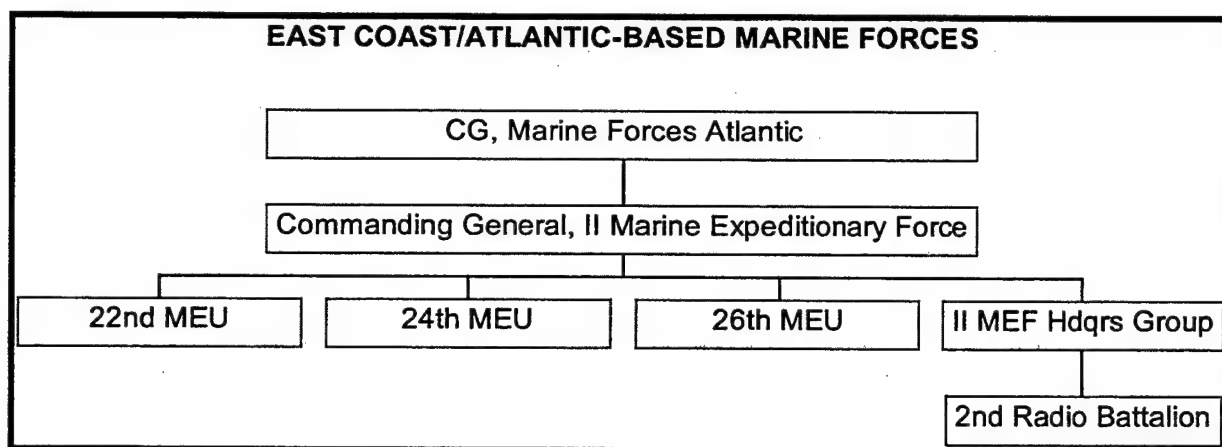


Figure 2.1. MARINE FORCES ATLANTIC

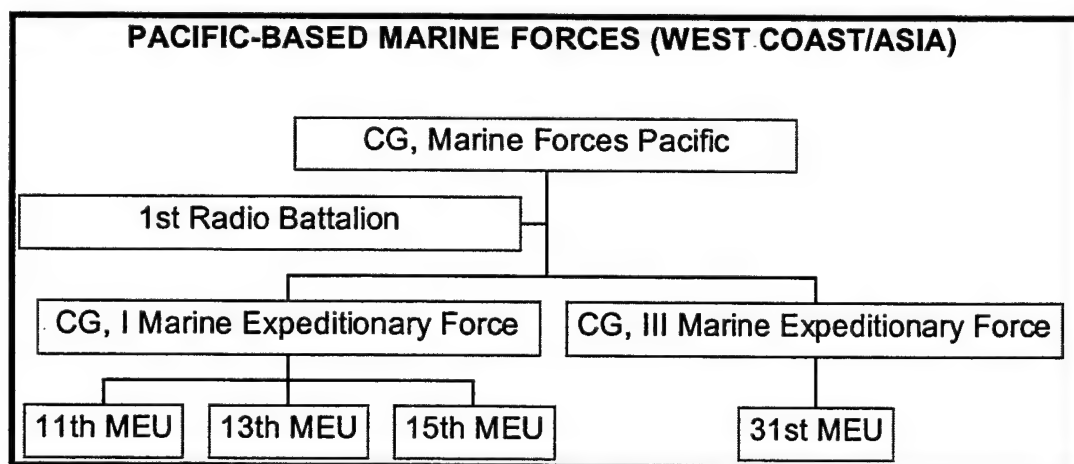


Figure 2.2. MARINE FORCES PACIFIC

F. CONCLUSION

This chapter has provided not only a thorough familiarization with First Radio Battalion, but also with the operational problem facing the organization. It is understood now that its placement in the chain-of-command (vertical command structure, or hierarchy) within MARFORPAC, combined with its geographic location, are the single largest contributing factors to this problem.

In addition to describing the problem and its effect on the battalion's human and non-human resources, the problem has been further defined through the lens of organizational theory.

In the next two chapters, the deliverables required by HQMC are developed. These items will, as mentioned before, be used by HQMC and MARFORPAC to create the new battalion's structure in terms of both personnel and gear, and budget appropriately for the actual future move.

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III. BUILDING THE BATTALION

A. INTRODUCTION

This chapter demonstrates the process of building a new battalion, beginning first by discussing Tables of Organization and Equipment, and later by specifically creating the new First Radio Battalion's tables. Although the finished results are displayed in Appendices A and B, a description of the process involved in creating the tables is central to this chapter. Both the tables created for Appendices A and B were forwarded to HQMC in June and August 2000 to help in their planning process for the battalion's move. For the purposes of this thesis, "structure" is defined as the manpower, whether bodies or billets, required to staff a command.

Before the battalion can be physically moved, there are several checkpoints that must be met. These checkpoints are all related to organizational issues regarding the battalion's relocation, namely:

- What will the new First Radio Battalion look like in terms of personnel?

- How will the new battalion be equipped to fight and complete its assigned missions?

B. WHAT ARE THE TABLES OF ORGANIZATION AND EQUIPMENT?

In use since before World War II, the tables of organization and equipment (T/O and T/E) are the essential, founding documents that must be drafted before a Marine Corps command has the authority to stand up. The tables detail the personnel and gear composition of any given Marine Corps unit worldwide. They are also the centerpieces in the Marine Corps Bulletin (MCBul) 5400 report, which is, according to Lieutenant Colonel Steve Baker at MCCDC's Total Force Structure Division, the principal founding document for any organization within the Marine Corps. Without the MCBul 5400, battalions, squadrons and MEFs wouldn't exist.

An example of the T/O is shown in Figure 3.1, below:

REPORT NO. 15921CAA-1 AS OF: 04/10			TABLE OF MANPOWER REQUIREMENTS T/O CHECKLIST							PAGE: 10224 PREPARED: 98/12/14		
1/O: 4918G 1 MEF COMMAND ELEMENT T/E: N4915												
LINE NO.	ENGLISH DESCRIPTION	BLT ALPHA GRD GRADE	B I S R Y T MOS N P A	MARINES OFF ENL CIV	OTHER SERVICES OFF ENL	NON-CHARGEABLE OFF ENL CIV	S W C P	S E S	SERV C N	EDU F C	LNG SCH	FTN
1	COMMANDING GENERAL	LIGEN	9903 MO	1								
2	AIDE-DE-CAMP	MAJ	9969 R O A									
3	SERGEANT MAJOR	SGTMAJ	9999 ME	1								
4	FOOD SERVICE SPEC	MSGT	3381 R E R									
5	CHAPLAIN	CAPT	4100 NO		1							
6	DRIVER	SGT	3531 ME	1								

Figure 3.1. U.S. MARINE CORPS T/O (example from Marine Corps Combat Development Command)

Each T/O has a specific number that references the command discussed in its outline (e.g., in Figure 3.1, the T/O number for the I MEF command element is 4918G). Each billet, from the commanding officer/general down to the lowest ranking Marine aboard the command, is assigned a line number (ascending in linear order from 1).

A short billet description is followed by descriptive categories, such as grade/rank, required military occupational specialty (MOS), branch of service, type (officer/enlisted), number of personnel per line number, and weapons code (rifle/pistol/crew-served weapon).

Marine Corps (and Navy) personnel are detailed to serve duty in any Marine Corps command according to the relevant T/O. Without the T/O, there would be no personnel assigned to a command to fill billets, and vice versa. Although many units strive to fill their T/O in full, this seldom occurs except in the event of crises and contingencies.

T/E FOR FMP UNITS INDICATED		TABLE OF EQUIPMENT					TYPE 2 ITEMS				09 MAY 1900	
TAN CONTROL NO.	NOMENCLATURE	U N I T N 4634	N 4635	N 4636	N 4637	N 4638						
1	2	3	4	5	6	7	8	9	10	11		
H8007	IIB MONITOR, VGA COLOR ACTIVE FORCES ONLY AS REQUIRED	EA										
H8008	IIB MONITOR, SUPER VGA COLOR ACTIVE FORCES ONLY AS REQUIRED	EA										
H8009	IIB MONITOR, OVER-SIZED VGA/SUPER VGA ACTIVE FORCES ONLY AS REQUIRED	EA										
H8010	IIB PRINTER, DOT MATRIX ACTIVE FORCES ONLY AS REQUIRED	EA										
H8011	IIB PRINTER, DOT MATRIX, WIDE CARRIAGE ACTIVE FORCES ONLY AS REQUIRED	EA										
H8013	IIB PRINTER, COLOR (ANY KIND) ACTIVE FORCES ONLY AS REQUIRED	EA										

PAGE NO. 10

Figure 3.2. U.S. MARINE CORPS T/E (example from Marine Corps Combat Development Command)

Figure 3.2 above illustrates the T/E. The T/O creates billets with which to staff a command with personnel; the T/E establishes the equipment the command needs to accomplish its mission. Figure 3.2 is from the current First Radio Battalion T/E, and illustrates how the entire table appears. Like the T/O, T/Es have a unique number that

refers to the command outlined in the table. This number generally corresponds to the command's T/O number for easy reference.

Whereas the T/O uses sequential line numbers to track billets, the T/E is organized according to the Table of Authorized Materiel (TAM) item control numbers (TAMCN). TAMCNs are generally grouped according to specific type categories, e.g., TAMCNs beginning with A denote communications-electronics gear; those beginning with E denote weapons and armory materiel; etc.

Even easier to read than a T/O, the T/E lists the TAMCN in sequential order followed by a common language nomenclature of the gear in question. After nomenclature, the T/E identifies the type of FMF units utilizing the gear (denoted by a Roman numeral code), and lists quantities authorized to the command (even differentiating down to subunits within the command, such as companies within battalions).

C. REVISING THE TABLE OF ORGANIZATION (PERSONNEL)

Appendix A presents the reorganized T/O for the new First Radio Battalion. To help frame the discussion on this

new T/O, several factors involved in creating it should be highlighted, including:

- The restriction on increasing force structure (number of personnel) mandated by the Commandant of the Marine Corps
- The requirement for additional structure in the ranks of the new First Radio Battalion
- The move to create a Select Marine Corps Reserve (SMCR) unit to shore up gaps in structure
- The current use of active and reserve personnel within the Marine Corps signals intelligence community

The primary constraint in building the new battalion's T/O was the Commandant of the Marine Corps' decision last January to plan for First Radio Battalion's reorganization and relocation without increasing the current active-duty structure (manpower and personnel). The additional structure in question was first identified by the Force Structure Planning Group (FSPG), a non-permanent action cell tasked annually to identify the need for structure modifications in existing and proposed Marine Corps units. The FSPG publishes its recommendations annually for the commanding generals under whose purview the units fall.

The FSPG's report of 27 April 1999 identified a 13 officer and 108 enlisted Marine personnel shortage for the new First Radio Battalion. This shortage created what the FSPG believed were organizational deficiencies, which would hinder I MEF's mission accomplishment. The Commandant's decision, however, vetoed the proposed personnel increase. This leaves the new First Radio Battalion with a total of no more than 25 officers and 403 enlisted Marines. (As noted before, the T/O is a paper staffing goal; the true number of personnel on deck at a given command is almost always less than authorized on T/O.)

Because no additional active duty structure could be used, the staff at HQMC's Director of Intelligence proposed creating a Select Marine Corps Reserve (SMCR) company to fill the personnel gap. As noted in Chapter 1, HQMC (Director of Intelligence) is tasked with planning for the battalion's move at the executive level prior to the move.

The SMCR company would include a headquarters element collocated with the battalion command post in California, with five to six subordinate platoons collocated with various NSA field sites nationwide. The reserve personnel in SMCR company would help shore up the battalion's T/O in the event of a major theater war or other similar crises.

At present, reserve signals intelligence support is provided under the control of the Cryptologic Reserve Program (CRP), which tracks and assigns reserve Marines in the signals intelligence MOS fields. However, there is no centrally located reserve command under the CRP to muster and drill the Marines.

In addition to the CRP Marines, the Marine Support Battalion (located at Fort Meade, Maryland) has been tasked with providing Marines to support the radio battalions in wartime or other situations as required. However, neither the CRP nor the Marine Support Battalion efforts are coordinated by a higher headquarters at the present time.

The proposed SMCR company would change this mode of operation. However, this is a tough task considering the geographic dispersal between the headquarters element and its subordinate platoons, as well as anticipated staffing difficulties in Marine Forces Reserve. These difficulties make the SMCR company a dubious solution to the personnel shortage.

Appendix A is the proposed new First Radio Battalion's T/O, and reflects a total of 25 officers and 427 enlisted Marines. Though this T/O requests 24 more enlisted Marines than the Commandant has mandated, the additional personnel will hopefully be authorized in the future or sourced from

existing and proposed Marine Corps signals intelligence organizations.

D. REVISING THE TABLE OF EQUIPMENT

Appendix B is the recommended T/E for the new First Radio Battalion. The T/O and T/E complement each other; it is necessary to provide a command filled with personnel and the gear needed to train and operate.

The primary consideration in rebuilding the T/E for the new battalion was HQMC's mandate that Third Radio Battalion must source its gear from the existing T/E of First Radio Battalion. This consideration facilitated building a new T/E, requiring a methodology of "fair share."

Simply stated, "fair share" is a fair division of equipment between the two battalions, given their personnel levels and the nature of their missions. The primary factor governing the "fair share" methodology in building a T/E, according to Staff Sergeant Richard Clark at MCCDC, is the need to tie "fair share" to organizational structure, namely the T/O.

The new First Radio Battalion will have a T/O approximately twice as large as Third Radio Battalion. Additionally, the new First Radio Battalion under I MEF will continue to support the three Camp Pendleton-based MEUs;

Third Radio Battalion will only support deployments with 31st MEU.

Mission particular items, such as light armored vehicles, were only allocated to the new First Radio Battalion in this revised T/E because Third Radio Battalion should have no use for this equipment in accomplishing its mission.

E. METHODOLOGY BEHIND DRAFTING THE NEW T/O AND T/E

To better illustrate the writer's process of building the T/O and T/E for the new First Radio Battalion, two specific examples from each table will be cited and reasons discussed for their inclusion in the new tables.

For the T/O in Appendix A, there are independent sections for both motor transport and electronic equipment maintenance, as in the existing T/O for First Radio Battalion (Hawaii). However, the sections in the new T/O are smaller by approximately 15 personnel each because the new First Radio Battalion is expected to draw additional assistance from motor transport and electronic maintenance resources already organic to their new location in Camp Pendleton. As a result of the smaller sections, there is also no requirement in the new T/O for an officer-in-charge

of these respective sections (a requirement which currently exists in First Radio Battalion).

Additionally, the MEWSS platoon (a platoon of light armored vehicles) has been included in the new T/O because I MEF possesses all the light armored vehicle capability in the Marine Forces Pacific region. This platoon will specifically be excluded from the Third Radio Battalion T/O as those personnel and assets are only needed in the new battalion at Camp Pendleton.

Including the MEWSS platoon in the new T/O requires including all light armored vehicles and associated equipment in the new T/E (Appendix B).

Additionally, personal issue items, including sleeping bags, cold weather gear and chemical protection overboots, are stocked in the new T/E based directly on the number of personnel authorized in the T/O. 452 personnel are authorized in this draft T/O. The number of personal issue items are stocked directly according to the personnel headcount, e.g., there are 452 sleeping bags authorized in the new T/E, one for each member of the battalion authorized in the new T/O.

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IV. MOVING THE BATTALION

A. INTRODUCTION

This chapter analyzes the actual cost of relocating personnel and vehicles from Hawaii to the continental United States. Using the Microsoft Excel CRYSTAL BALL spreadsheet add-in, various inputs provide a baseline from which to budget the movement of as many as 260 Marines and sailors, and more than 100 items of rolling stock, halfway across the Pacific.

After discussing CRYSTAL BALL and its particular application to the cost estimation process, the chapter describes the inputs to the simulation process and the methodology guiding their use. The remainder of this chapter highlights the cost simulation process and estimated costs to transfer personnel and ship vehicles.

B. A WORD ABOUT THE SIMULATION: PROGRAM AND INPUTS

This chapter provides HQMC a probabilistic estimate of the costs involved in transferring the required number of Marines and families stateside, as well as the costs of shipping numerous vehicles. The Microsoft Excel CRYSTAL

BALL spreadsheet add-in will be used to accomplish this goal.

A spreadsheet-based tool, CRYSTAL BALL utilizes Monte Carlo simulation and analysis, or distribution sampling, to consider a finite spread of best-guess outcomes and provide a range of literally thousands of potential values and a distribution of their occurrences and probabilities.

Monte Carlo simulation and analysis uses distribution-based random sampling to approximate solutions to probabilistic problems, such as varying shipping costs and numbers of military personnel and dependents. This type of simulation provides a more realistic set of cost estimations.

The inputs to the CRYSTAL BALL simulation vary according to the type of estimate being run. Historical budget data has been provided by First Radio Battalion's former logistics officer, Major Chris Edwards, for shipping vehicles stateside to southern California. For our purposes here, the only relevant shipping and transport costs are those involving delivery from Hawaii to California. However, the only estimates and simulations for T/E items involve vehicles; no estimates are provided for shipping containers and equipment, due to the lack of input data to CRYSTAL BALL.

For personnel transfer, standardized rates are used, courtesy of HQMC (Programs and Resources). These rates are calculated for the current programmed year and future outyears (adjusted for inflation) in the annual guidance for preparation and submission of budget estimates for the Department of the Navy's (DON) annual budget reviews.

C. COST OF RELOCATION (PERSONNEL)

As mentioned, annual DON budget estimates use standardized rates to estimate costs and prepare budget line items for the Military Personnel appropriation that funds permanent change of station (PCS) moves from station to station. Per Candice L. McPeak, the military personnel budget analyst at HQMC (RPF), the rates are calculated as an average amount per Marine, whether single or married with five children. The rate is calculated as follows, using the current fiscal year as an example:

$$\frac{\text{TOTAL BUDGETED AMOUNT FOR PCS MOVES (FY 2000)}}{\text{TOTAL OFFICER (OR ENLISTED) MOVES IN FY 2000}}$$

This provides a cost per officer or enlisted Marine that is an average cost per move for the current fiscal year, called the current year rate. However, actual

personnel transfers will not occur until FY 2004, so these costs must be adjusted for the effects of inflation to determine the correct budgets. HQMC adjusts the current year rate for planning purposes in the outyears, the following formula is used (assuming a two percent inflation rate):

$$\begin{aligned} &(\text{CURRENT YEAR RATE} \times .7842) \times 1.02 \\ &+ (\text{CURRENT YEAR RATE} \times .2158) \end{aligned}$$

This formula provides the inflated standardized rate for the outyears with the properly inflated current year costs. According to Mrs. McPeak, only 78.42 percent of the rate is adjusted for inflation because certain entitlements, like dislocation allowances, are not pegged to inflation. Because basic pay and allowances are utilized in the annual amount budgeted for PCS moves, there are separate rates in all move categories for officers and enlisted. There are six categories under which the rates for personnel moves fall, including:

- new accessions
- training school moves
- operational moves (for personnel relocating within CONUS)

- rotational moves (for personnel relocating outside of CONUS)
- separations
- entire unit moves

This analysis and simulation uses the operational rate for moves within CONUS; Hawaii, while outside of CONUS, is considered a domestic move (per guidance from HQMC). The PCS operational move rates for FY 2004, already prepared by HQMC, are:

- \$15,896.38 for officers
- \$4,218.80 for enlisted

(Note: the figures above assume a two percent inflation rate for the outyears according to DON Budget Guidance Memorandum BG 00-2A.)

Because insufficient data exists to determine the upper and lower bounds of actual personnel PCS costs, the average rates must suffice for simulation purposes. Regardless, because the number of personnel transferring is likely to be large, the average rate will likely more accurately reflect actual costs. Were the sample size of personnel transferring to be very small, it is less likely that the sample average costs would be comparable to the average rates provided.

The only indeterminate factor is the precise number of personnel who will transfer from Hawaii to Camp Pendleton. The most reliable presumption is to assume half of the new battalion's officers and enlisted Marines and sailors will be sourced from the original First Radio Battalion, with the remaining billets sourced by new PCS transfers. For this analysis, new PCS transfers are not a relevant cost. They do not involve a change in status for personnel from the original First Radio Battalion, and no additional cost will be incurred by rerouting these personnel to southern California instead of Hawaii.

Based on the T/O that this writer built in Chapter 3 and provided in Appendix A, it is presumed that 12 officers and 214 enlisted Marines should be transferred from the current First Radio Battalion to fill the ranks in its new location. To calculate costs based solely on these expected numbers would portray a misleading degree of certainty. This is where the Monte Carlo simulation process becomes useful.

A realistic spread of officers and enlisted personnel centered on the likely values of 12 and 214 dictated a triangular distribution for the simulation assumptions. From there, a large number of trials (5,000) were run under CRYSTAL BALL to provide the bottom-line totals listed below

in Figure 4.1; these values represent the mean values in simulation reports.

FIRST RADIO BATTALION PCS MOVES	
<u>CATEGORY</u>	<u># OF PERSONNEL</u>
OFFICERS	12
ENLISTED	221
TOTAL AMOUNT BUDGETED TO TRANSFER ALL PERSONNEL:	
\$1,135,725.39 (CY04\$)	

FIGURE 4.1. RESULTS OF SIMULATION FOR PERSONNEL TRANSFER

Figure 4.2 below lists the results of simulation by percentiles, which establishes confidence intervals for planning and budgeting purposes. Based on a 95 percent confidence interval, the maximum amount budgeted for PCS personnel transfer should be \$1,222,238 (CY04\$).

Percentile	Value
0%	\$1,015,915.26
5%	\$1,063,518.69
10%	\$1,075,225.69
15%	\$1,084,872.17
20%	\$1,092,569.53
25%	\$1,099,532.73
30%	\$1,106,108.98
35%	\$1,112,062.55
40%	\$1,118,584.26
45%	\$1,125,090.92
50%	\$1,131,377.68
55%	\$1,137,863.52
60%	\$1,144,219.35
65%	\$1,151,393.90
70%	\$1,160,210.40
75%	\$1,169,433.27
80%	\$1,178,712.12
85%	\$1,190,945.12
90%	\$1,205,352.35
95%	\$1,222,238.36
100%	\$1,275,802.39

FIGURE 4.2. PROBABILISTIC RANGE OF VALUES FOR
PCS PERSONNEL TRANSFER (CY04\$)

D. COST OF RELOCATION (VEHICLES)

The simulation inputs and assumptions required to estimate the cost of transferring vehicles to the mainland are more numerous and detailed than the personnel costs. To estimate the cost of moving more than 100 items of rolling stock more than 2,500 miles, we must account for the rate per vehicle times the number of vehicles, plus a surcharge for ground transportation from the port of debarkation to Camp Pendleton.

Budget data exists for vehicles but is scant for containers and equipment. One reason for this shortage of empirical data, according to Major Kevin McCoyd, First Radio Battalion's current logistics officer, is twofold:

- the battalion's occasional use of "opportunistic lift", or space-available movement aboard military aircraft and surface ships (such space-available movement incurs no additional cost for the battalion or MARFORPAC)
- Fleet Exercise Logistics Support (FELS) and Non-Fleet Exercise Logistics Support (NFELS) budgeted from the Operations and Maintenance, Marine Corps (O&M,MC) appropriation for Commander-in-Chief Pacific Fleet (CINCPACFLT) often pays for these shipping and transportation expenses (FELS is used for Fleet Directed Exercises and Joint Chiefs of Staff-directed conferences; non-FELS is used by the Marine Aircraft Wings in support of aviation exercises)

The relevant vehicles fall into three distinct categories: light armored vehicles (LAV), High Mobility Multiple Wheeled Vehicles (HMMWV), and Trucks (including both five-ton and seven-ton trucks). Historical budget data

from First Radio Battalion reveals that rates differ from one category to the next, and the rates for both HMMWVs and trucks show a large degree of variability based on size and seasonality. (Rates for LAVs tend to be an average amount with little to no variation.) Ground transportation costs also show variability, based on load size and other factors. The data provided by Major McCoyd includes:

<u>CATEGORY</u>	<u># OF VEHICLES</u>	<u>RATES (CY00\$)</u>
LAV	7	\$2,800 (average)
HMMWV	46	\$838-2,820 (likely value \$1,500)
TRUCKS	50	\$5,600-10,800 (likely value \$6,506)

FIGURE 4.3. FIRST RADIO BATTALION VEHICLES:
RATES BY CATEGORY

(Note: Ground transportation costs display a uniform distribution varying from .20 to .27 of the total shipping costs.)

The varying rates per vehicle type (except LAVs) and for ground transportation provide the basis for the CRYSTAL BALL simulation. The bottom-line total, per the simulation report, is a mean of \$593,752 (CY00\$), which must next be adjusted for inflation to FY 2004. Normalizing for inflation uses tables provided by HQMC; expected inflation rates are 1.5 to two percent for the O&M,MC appropriation

that would fund this movement (through MARFORPAC). The inflation table for the relevant years is recreated below.

FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
1.2	1.5	1.6	1.7	2.0

The new, normalized total for shipping and transporting First Radio Battalion's vehicles is \$635,164 (CY04\$).

As with personnel, Figure 4.4 below lists the results of simulation by percentiles, establishing confidence intervals for planning and budgeting purposes. Based on a 95 percent confidence interval, the maximum amount budgeted for vehicle shipping and transportation costs should be \$728,646 (CY00\$), which is normalized for inflation to \$779,467 (CY04\$).

<u>Percentile</u>	<u>Value</u>
0%	\$420,007
5%	\$485,395
10%	\$501,748
15%	\$515,000
20%	\$525,715
25%	\$536,457
30%	\$546,033
35%	\$555,085
40%	\$564,426
45%	\$573,812
50%	\$584,291
55%	\$595,119
60%	\$606,651
65%	\$619,282
70%	\$631,247
75%	\$645,792
80%	\$661,703
85%	\$679,468
90%	\$701,381
95%	\$728,646
100%	\$822,313

FIGURE 4.4. PROBABILISTIC RANGE OF VALUES FOR
VEHICLES SHIPPING AND TRANSPORTATION COSTS (CY00\$)

V. CONCLUSION

A. SUMMARY

This thesis was originally intended to justify moving First Radio Battalion to Camp Pendleton, California. Before work could begin on that study, the Commandant decided last January to move the battalion. That decision changed the thesis from an academic argument to a practical analysis supporting an executive decision. As a result, and with the support of HQMC (Intelligence Plans and Policy), this study became less about justifying the move and more about helping to make it happen.

Undiscussed in this study is the recent Congressional legislation in the FY 2000 National Defense Authorization Act that mandates the following changes in personnel and operational tempo for all military units:

- A Marine cannot deploy or remain deployed more than 182 days of the preceding 365 days without approval from the first brigadier general in (his/her) chain of command

- A Marine cannot deploy or remain deployed more than 220 days of the preceding 365 days without approval from the Assistant Commandant of the Marine Corps (ACMC)
- A Marine deployed in excess of 250 days of the preceding 365 days rates per diem payments of \$100 per day beginning on the 251st day

This legislation, enacted in response to complaints from servicemembers and their families about the relentless pace of military operations in a shrinking military force, places a heavy fiscal burden on military units across the country, but particularly First Radio Battalion. The act further stipulates that the per diem payments will be sourced from the Military Personnel appropriation, which also handles PCS moves and salaries for active duty and reserve military personnel, with the final caveat: "No additional Congressional funding will be provided to comply with the per diem payments mandated."

The message is clear: personnel and operational tempo at its present breakneck pace must cease or the services will pay the price. While there is no easy solution to making such dramatic changes, the decision to relocate and reorganize First Radio Battalion is a step in the right direction. Smaller deployments, such as routine planning

conferences or exercises at I MEF, will no longer mean a week or a month away from the family in Hawaii.

In the end, this amounts to not only a smart move for the Corps, but a wise move for the morale and well-being of the Marines and sailors who have thus far taken care of business in a tough situation.

B. RESULTS OF STUDY

At this juncture, a new battalion has been born, at least on paper. The fruits of this collective labor will not be realized for another three or four years. However, our results can be tabulated and summarized in this chapter to allow for a broader view of the new First Radio Battalion, particularly in light of the three deliverable items required for HQMC.

The Table of Organization is seen in detail in Appendix A and recommends a battalion of 25 officers and 427 enlisted Marines, which is 24 more enlisted Marines than currently dictated by the Commandant of the Marine Corps. These numbers, however, appear to be the bare minimum necessary to effectively staff and operate the new battalion under I MEF without attenuating the current level of operational support.

The Table of Equipment is seen in detail in Appendix B and includes seven LAVs, 46 HMMWVs and 50 trucks. As discussed in Chapter 3, the T/E is built on a "fair share" principle and is linked directly to the new battalion's T/O structure.

The cost estimates for moving people and vehicles is summarized in Figure 5.1 below:

<u>CATEGORY</u>	<u>BUDGETED AMOUNT (CY04\$)</u>
Personnel	1,135,725.39
Vehicles	635,164.12
TOTAL COST (EST.)	1,770,889.51

FIGURE 5.1. SUMMARY OF COSTS FOR PERSONNEL TRANSFER AND VEHICLE SHIPMENT IN FISCAL YEAR 2004

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**APPENDIX A. BATTALION TABLE OF
ORGANIZATION (CAMP PENDLETON)**

Pursuant to the intent of the Commandant of the Marine Corps, and based on the Force Structure Planning Group's report of 27 Apr 1999, the revised table of organization for the new First Radio Battalion was drafted in order to eliminate unnecessary billets while still retaining the core mission personnel required to support I MEF and its subordinate elements.

LINE NO	BILLET	GRADE	MOS	OFF	ENL
1	Commanding Officer	LtCol	0202	1	
2	Executive Officer	Maj	0202	1	
3	Sergeant Major	SgtMaj	9999		1
4	Battalion Chaplain	LT	4100		
5	Religious Prog Asst	RP3	2401		
6	Career Planner	Sgt	8421		1
S-1 SECTION					
7	Adjutant	Lt	0180	1	
8	Admin Chief	SSgt	0193		1
9	Battalion Legal Clerk	Sgt	0151		1
10	Admin Clerk	Cpl	0151		1
11	Admin Clerk	LCpl	0151		2
S-2 SECTION					
12	S-2 Officer	Capt	0202	1	
13	S-2 Chief	MGySgt			1
Special Security Officer					
14	A/SSO Chief	GySgt	2651		1
15	PERSEC NCO	Sgt	2621		1
16	INFOSEC NCO	Sgt	2651		1
17	CMCC NCO	Cpl	2651		2
MEF HQ Support Element					
18	Regional Team Chief	MSgt	267X		1
SIGINT/EW Analysis Team (CENTCOM)					
19	Regional Analyst	GySgt	2671		1
20	Regional Analyst	GySgt	2671		1
21	Signals Analyst	Sgt	2621		4
22	ELINT Analyst	Sgt	2631		1
23	ELINT Analyst	Cpl	2631		2
24	ELINT Analyst	LCpl	2631		1
25	Cryptologic Network Analyst	Sgt	2651		2
SIGINT/EW Analysis Team (PACOM)					
26	Regional Analyst	GySgt	2673		2
27	Signals Analyst	Sgt	2621		4
28	ELINT Analyst	Sgt	2631		1
29	ELINT Analyst	Cpl	2631		2
30	ELINT Analyst	LCpl	2631		1
31	Cryptologic Network Analyst	Sgt	2651		2

S-3 SECTION

32 S-3 Officer	Maj	0202	1	
33 Current Ops Officer	Capt	0202	1	
34 Future Ops Officer	Lt	0206	1	
35 IO Support Officer	Lt	0206	1	
36 Ops Chief	MGySgt	2691		1
37 Ops/TPFDD Clerk	Cpl	2621		1
38 Ops/TCO Operator	Cpl	2621		1
39 Collections Chief	SSgt	2621		1
40 Dissemination Clerk	Cpl	2621		1
41 Training Chief	SSgt	2621		1
42 NBC NCO	Sgt	5711		1

S-4 SECTION

43 S-4 Officer	Capt	0402	1	
44 MMO	Lt	0402	1	
45 Log/Embark Chief	SSgt	0431		1
46 Log/Embark Clerk	LCpl	0431		1
47 Embark NCO/Mtl Mgmt Chief	Sgt	0431		1
48 MMO NCO	Cpl	0411		2

S-6 SECTION

49 S-6 Officer	Maj	0202	1	
50 S-6 Chief	MGySgt	2651		1
51 SIM Clerk	Cpl	2621		1
52 Ops/Plans Clerk	Cpl	2621		1
53 Frequency Manager	LCpl	2651		1
54 CMS Chief	GySgt	2621		1
55 CMS Clerk	Cpl	2621		1

HEADQUARTERS & SERVICE COMPANY

HEADQUARTERS ELEMENT

56 Commanding Officer	Capt	0202	1	
57 Executive Officer	Lt	0206	1	
58 First Sergeant	1stSgt	9999		1
59 Company Gunny	GySgt	2621		1

SUPPLY PLATOON

60 Supply Officer	Capt	3002	1	
61 Supply Chief	GySgt	3043		1
62 Supply Admin Chief	LCpl	3043		1
63 Electronic Stockman	Cpl	3043		1
64 Warehouseman	Sgt	3051		2

65 Supply Admin Man	LCpl	3043	2
66 Electronic Stockman	Cpl	3051	1
67 General Warehouseman	LCpl	3051	3
68 Supply Admin	LCpl	3043	3
69 Infantry Weapons Armorer	Cpl	2111	1
70 Infantry Weapons Armorer	LCpl	2111	1
71 Chief Cook	GySgt	3381	1
72 Cook	Sgt	3381	1
73 Cook	Cpl	3381	1
74 Cook	LCpl	3381	1

MOTOR TRANSPORT SECTION

75 Section Chief	MSgt	3537	1
76 Log Data Control Clerk	LCpl	0411	1
77 Maintenance Chief	GySgt	3529	1
78 Motor Vehicle Supervisor	Sgt	3531	1
79 Motor Vehicle Operator	Cpl	3531	3
80 Motor Vehicle Operator	Sgt	3531	4
81 Automotive Mechanic	SSgt	3529	1
82 Wrecker Operator	Cpl	3536	1
83 Automotive Mechanic	Sgt	3521	2
84 Light Vehicle Operator	Cpl	3521	2
85 Automotive Mechanic	LCpl	3521	12
86 Motor Vehicle Mechanic	Cpl	3521	1

ENGINEER/POWER EQUIP SECTION

87 LAV Mechanic	GySgt	2147	1
88 Elec Equipment Repair Chief	SSgt	1142	1
89 Engr Equip/Diesel Mechanic	Sgt	1341	1
90 LAV Mechanic	Cpl	2147	3
91 Electrician	Sgt	1141	1
92 Elec Equip Repair Specialist	Cpl	1142	1
93 Electrician	LCpl	1141	1
94 Elec Equip Repair Specialist	LCpl	1142	2
95 Refrigeration Mechanic	Sgt	1161	1
96 Engr Equip/Diesel Mechanic	LCpl	1341	2
97 Electrician	LCpl	1141	2
98 LAV Mechanic	LCpl	2147	2

EM SECTION

99 EM Chief	MSgt	2891	1
100 Log Data Control Clerk	LCpl	0411	1
101 Radio Technician	GySgt	2861	1
102 Radar Tech	SSgt	2861	1
103 Crypto/TTY Tech	SSgt	2861	1
104 Radio Technician	Sgt	2861	1
105 MSC-63A Tech	Sgt	2821	1
106 MSC-63A Tech	GySgt	2826	1

107Radio Technician	Sgt	2861	1
108Radio Technician	Cpl	2841	2
109Radio Repairman	Cpl	2811	1
110MSC-63A Tech	Cpl	2818	1
111MSC-63A Tech	Sgt	2818	1
112Radio Repairman	Cpl	2841	6
113COMSEC Equip Tech	LCpl	2841	1
114COMSEC Equip Tech	LCpl	2881	1
115MSC-63A Tech	Sgt	2826	1
116MSC-63A Tech	Cpl	2818	1

MEDICAL SECTION

117Field Service Technician	HM1	8404	1
118Field Service Technician	HM2	8404	2
119Field Service Technician	HM3	8404	1

ALPHA COMPANY

HEADQUARTERS ELEMENT

120Commanding Officer	Capt	0202	1
121Executive Officer	Lt	0206	1
122First Sergeant	1stSgt	9999	1
123Ops Chief	GySgt	2621	1
124MIMMS Clerk	Cpl	26XX	1

DIVISION HQ SUPPORT SECTION

125SIGINT/EW Support Officer	WO	2602	1
126SIGINT/EW Support Chief	MSgt	2691	1
127ELINT Analyst	GySgt	2631	1
128ELINT Op	Cpl	2631	1
129ELINT Op	LCpl	2631	3
130Signals Analyst	SSgt	2621	1
131Signals Op	Cpl	2621	2
132Traffic Analyst	SSgt	2671	2
133TA Apprentice	Cpl	2621	1
134TA Apprentice	Cpl	2673	1
135Cryptologic Network Analyst	LCpl	2651	1

SIGINT/EW SUPPORT PLATOON

136Platoon Commander	Lt	0206	1
137Platoon Sergeant	GySgt	2621	1

Regimental HQ Support Section

138SIGINT/EW Support Chief	SSgt	2671	1
139Signals Analyst	Sgt	2621	1
140Signals Op	Cpl	2621	1
141Traffic Analyst	Sgt	2671	1
142TA Apprentice	Cpl	2671	1
143TA Apprentice	LCpl	2621	1

144DF Control/Plot Op	LCpl	2621		1
145System Network Analyst	LCpl	2651		1
SIGINT/EW Team				
146Intercept Op/TL	Sgt	2621/267X		4
147Intercept Op/ATL	Cpl	2621/267X		4
148Intercept Op	LCpl	2671		4
149Signals Op	LCpl	2621		8
150System Network Op	LCpl	2651		4
EA Team				
151EA Team Ldr	Cpl	2621		3
152System Network Op	LCpl	2651		3
153EA Intercept Op	LCpl	2671		3
SIGINT/EW SUPPORT PLATOON				
154Platoon Commander	Lt	0206	1	
155Platoon Sergeant	GySgt	2621		1
156Regimental HQ Support Section				
157SIGINT/EW Support Chief	SSgt	2673		1
158Signals Analyst	Sgt	2621		1
159Signals Op	Cpl	2621		1
160Traffic Analyst	Sgt	2673		1
161TA Apprentice	Cpl	2673		1
162TA Apprentice	LCpl	2621		1
163DF Control/Plot Op	LCpl	2621		1
164System Network Analyst	LCpl	2651		1
SIGINT/EW Team				
165Intercept Op/TL	Sgt	2621/267X		4
166Intercept Op/ATL	Cpl	2621/267X		4
167Intercept Op	LCpl	2671		4
168Signals Op	LCpl	2621		8
169System Network Op	LCpl	2651		4
EA Team				
170EA Team Ldr	Cpl	2621		3
171System Network Op	LCpl	2651		3
172EA Intercept Op	LCpl	2673		3
MEWSS PLATOON				
173Platoon Commander	Lt	0206	1	
174Platoon Sergeant	GySgt	2621		1
MEWSS Teams				
175Intercept Op/TL	Sgt	2621/267X		6
176Intercept Op/ATL	Cpl	2621/267X		6
177Signals Op	Cpl	2621		6
178Signals Op	LCpl	2621		6
179ELINT Op	LCpl	2631		6

BRAVO COMPANY

HEADQUARTERS ELEMENT

180	Commanding Officer	Capt	0202	1	
181	Executive Officer	Lt	0206	1	
182	First Sergeant	1stSgt	9999		1
183	Ops Chief	GySgt	2621		1
184	MIMMS Clerk	Cpl	26XX		1

WING HQ SUPPORT SECTION

185	SIGINT/EW Support Chief	GySgt	2631		1
186	Targeting Support Rep	SSgt	2621		1
187	ELINT Sup	SSgt	2631		1
188	ELINT Op	Cpl	2631		2
189	ELINT Op	LCpl	2631		2
190	IO Analyst	SSgt	2671		1
191	IO Analyst	Sgt	2673		1
192	IO Analyst	Cpl	2621		1
193	Cryptologic Network Analyst	LCpl	2651		1

TECHNICAL PROCESSING PLATOON

194	Tech Processing Officer	CWO4	2602	1	
195	Tech Processing Chief	MSgt	2691		1
196	Signals Processing Team				
197	Signals Specialist	SSgt	2621		2
198	Signals Specialist	Sgt	2621		2
199	ELINT Processing Team				
200	ELINT Specialist	SSgt	2631		1
201	ELINT Specialist	LCpl	2631		5
	Transcription Team				
202	Transcription Specialist	GySgt	2671		1
203	Transcription Specialist	SSgt	2671		1
204	Transcription Specialist	Sgt	2671		1
205	Transcription Specialist	Cpl	2671		1
206	Transcription Specialist	LCpl	2671		1
207	Transcription Specialist	GySgt	2673		1
208	Transcription Specialist	Cpl	2673		3
209	Transcription Specialist	LCpl	2673		1
210	Transcription Specialist	Sgt	2675		1
211	Transcription Specialist	Cpl	2675		2
	Network Processing Team				
212	Network Specialist	Sgt	2651		2
213	Network Specialist	Cpl	2651		2

RADIO RECON PLATOON

214	Platoon Commander	Lt	0206	1	
215	Platoon Sergeant	MSgt	2691		1
216	Training Chief	GySgt	2671		1

217 Air Delivery Chief/ParaOps NCO	Sgt	0451		1
218 Air Delivery Specialist	Cpl	0451		1
219 Air Delivery Specialist	LCpl	0451		1
Radio Recon Teams				
220 Intercept Op/TL	SSgt	2621/267X		8
221 Intercept Op/ATL	Sgt	2621/267X		8
222 Intercept Op	Cpl	267X		8
223 Signals Op	Cpl	2621		8
224 Signals Op	LCpl	2621		8
225 Systems Network Op	LCpl	2651		8
SIGINT/EW NETWORK PLATOON				
226 Platoon Commander	Lt	0206	1	
227 Platoon Sergeant	MSgt	2651		1
SIGINT/EW Comm Operations				
228 Comm Chief	SSgt	2537		1
229 Wire Chief	Sgt	2512		1
230 SIGINT/EW Comm Op	Sgt	2651		5
231 SIGINT/EW Comm Op	Cpl	2651		5
232 SIGINT/EW Comm Op	LCpl	2651		5
SIGINT/EW Network Support Section				
233 SIGINT/EW Network Sup	Sgt	2651		1
234 SIGINT/EW Network Op	Cpl	2651		5
235 SIGINT/EW Network Op	LCpl	2651		5
Network Exploitation Section				
236 SNCOIC	GySgt	2651		1
Exploitation Teams				
237 Network Exploitation Spec/TL	SSgt	2651		4
238 Network Exploitation Spec/ATL	Sgt	2621/267X		4
239 Network Intercept Spec	Cpl	2621/267X		4
240 Network Intercept Spec	LCpl	2621/267X		4
TOTAL:			25	427

**APPENDIX B. BATTALION TABLE OF
EQUIPMENT (CAMP PENDLETON)**

Akin to reorganizing the battalion's personnel structure according to the new Table of Organization, the battalion's equipment must be reapportioned to reflect both the reduced personnel and the alteration in mission by shifting from MARFORPAC's operational command to I MEF only. This new Table of Equipment was built according to the principle of "fair share," to ensure the use of equipment for the newly formed Third Radio Battalion, while still providing for mission essential items such as the light armored vehicles.

TAMCN	FMF UNITS	NOMENCLATURE	UNIT PER	A CO	B CO	H&S CO	TOTAL
A0004	VIIG	ACCESSORY MAINT KIT, TELEPHONE MK1823 (V) /TT	KT			1	1
A0014	VIIG	ADAPTER, PP8035	EA	1	1	1	3
A0017	VIIG	ADAPTER, PP8034	EA	1	1	1	3
A0059	VIIG	ANTENNA GROUP OE254/GRC	EA	5	5	5	15
A0062	VIIGP	TSQ-190 (V)	EA			1	1
A0255	VIIGP	UNIT OPS CENTER, COMBAT OPS CENTER	EA			1	1
A0258	VIIG	AN/MSC63A	EA			2	2
A0283	VIIG	AN/PSQ-9	EA	4			4
A0284	VIIG	AN/UGC74-C (V) 3	EA			2	2
A0287	VIIGP	COMM COLLECTION OUTSTATION AN/TYC ()	EA		8		8
A0319	VIIG	CONTROL, RADIO SET C6709/G	EA			1	1
A0412	VIIG	AN/ULQ-19 (V) 1	EA	8			8
A0425	VIIGP	TERMINAL, COMM, AUTOMATED, DATA (DACT)	EA	5	5	4	14
A0498	VIIG	AN/PSC-2A	EA	4	10		14
A0500	VIIGP	ENTRY DEVICE, MESSAGE, DIGITAL (DMED)	EA			5	5
A0517	VIIG	AN/PRD-12	SE	10			10
A0652	VIIG	AN/GSC-54	EA			2	2
A0903	VIIGP	RADIO, MANPACK	EA			5	5
A0917	VIIG	AN/PSC-3	EA			12	12
A0918	VIIG	AN/PSC-5	EA		4	4	8
A0932	VIIG	INTEL OPS WORKSTATION, AN/UYQ-88	EA	2		2	4
A0966	VIIG	MOBILE EW SUPPORT SYSTEM (MEWSS) PIP, AN/MLQ-36A	EA	6			6
A1078	VIIG	MULTIPLEXER, TD1234	EA			1	1
A1219	VIIG	RECON, RADIO SS2	EA		6		6
A1253	VIIG	POWER SUPPLY, PP7333	EA	5		10	15
A1260	VIIG	AN/PSN-11 (PLGR)	EA	10	10	9	29
A1275	VIIG	MU848A/PSC-2A	EA	1	3		4
A1305	VIIG	PUBLIC ADDRESS SET, AN/UIQ10 (V)	EA			1	1
A1700	VIIGP	TEAM RADIO	EA			13	13
A1935	VIIG	AN/MRC-138B (V)	EA	3		6	9
A1957	VIIG	AN/MRC-145A	EA	5		3	8

A2051	VIIG	AN/PSQ-4 (PLRS)	EA	1	1		2
A2065	VIIG	AN/PRC-104B (V)	EA	5	5	7	17
A2069	VIIG	AN/PRC-113 (V) 3	EA		6		6
A2070	VIIG	AN/PRC-119A	EA	15	4	20	39
A2072	VIIGP	AN/GRC-231A (V) 2	EA	6			6
A2073	VIIG	AN/PRC-119D	EA	9			9
A2079	VIIG	AN/PRC-119F	EA		3		3
A2151	VIIG	AN/VSQ-1 (PLRS)	EA	1	1		2
A2164	VIIG	AN/VRC-83 (V) 2	EA	2	2	4	8
A2168	VIIG	AN/VRC-89A	EA			5	5
A2169	VIIG	AN/VRC-90A	EA			3	3
A2335	IIB	SHELTER, 10FT, EMI, MAINT COMPLEX	EA			3	3
A2336	IIB	SHELTER, 20FT, EMI, MAINT COMPLEX	EA			3	3
A2337	IIB	SHELTER, 20FT, RIGID, MAINT COMPLEX	EA			3	3
A2338	IIB	SHELTER, 10FT, RIGID, MAINT COMPLEX	EA			2	2
A2400	VIIGP	TERMINAL, CHANNEL, SINGLE	EA			2	2
A2480	VIIG	SWITCHBOARD, SB22A/PT	EA			2	2
A2505	VIIG	SWITCHBOARD, SB3614 (V) TT	EA			1	1
A2508	VIIG	SWITCHING UNIT, SB3865	EA			1	1
A2532	VIIG	TCO DESKTOP HP712/100	EA			1	1
A2538	VIIGP	DATA NETWORK SERVER	EA			1	1
A2548	VIIGP	MCHS SERVER, PORTABLE	EA			1	1
A2551	VIIG	AN/USC-55A	EA			5	5
A2628	VIIG	TCAC WORKSTATION	EA			6	6
A2629	VIIG	TCAC (PIP) AN/MYQ-8	EA			2	2
A2634	VIIG	TCAC REMOTE AN/UYQ-83	EA			4	4
A2635	VIIG	TA-838A/TT	EA			6	6
A2689	VIIGP	COMMAND SYSTEM, TACTICAL	EA			2	2
A2808	VIIG	TEST SET, OPTICAL COMMS AN/GSM-317	EA			1	1
A3231	VIIGP	TRANSIT BASE STATION	EA			2	2
A3235	VIIG	AN/TSQ-190 (V) 2	EA			1	1
A7005	VIIG	ANALYZER, SPECTRUM HP8562A/H03	EA			2	2
A7008	VIIG	ANALYZER,	EA			1	1

		SPECTRUM 8568B					
A7021	VIIG	COUNTER, ELECTRONIC, DIGITAL READOUT	EA			6	6
A7046	VIIG	GENERATOR, SIGNAL 68347M	EA			1	1
A7050	VIIG	GENERATOR, SIGNAL 8340B	EA			1	1
A7051	VIIG	METER, POWER 437B/E23	EA			1	1
A7052	VIIG	GENERATOR, SIGNAL 8643A	EA			5	5
A7055	VIIG	TEST SET, RF POWER 4410A-500	EA			5	5
A7057	VIIG	MULTIMETER (EARTH) 3710	EA			1	1
A7059	VIIG	OHMMETER R1LC	EA			3	3
A7060	VIIG	OSCILLOSCOPE	EA			3	3
A7061	VIIG	OSCILLOSCOPE 2246A	EA			6	6
A7072	VIIG	ADAPTER, TEST, SINGARS RADIO J4843/GRM114B	EA			2	2
A7080	VIIG	TEST SET, RADIO VHF TS4291/U	EA			4	4
A7082	VIIG	TEST SET, RADIO TS4317/GRM	EA			8	8
A7085	VIIG	TEST SET, DISTORTION TS4353/U	EA			3	3
A7090	VIIG	REFLECTOMETER, TIME DOMAIN ME562/P	EA			1	1
A7501	VIIG	TEST STATION TN/USM646	EA			1	-
A7595	VIIG	TEST SYSTEM, THIRD ECHELON AN/USM657 (V) 1	SE			1	1
A7700	VIIG	ANALYZER- CHARGER, BATTERY PP8333/U	EA			3	3
A7705	VIIGP	POWER SUPPLY, 713860-1	EA	3		12	15
A7706	VIIG	POWER SUPPLY, VDC, 0-40, PP8436/P	EA			20	20
A7900	IIE	KIT, TOOL, MAINT, ELECTRONIC MK2569/P	EA			25	25
A7955	VIIG	KIT, MAINT, EQUIPMENT, ELECTRONIC MK2663/U	EA			1	1
A8008	VIIG	POWER SUPPLY, AUX HYP-71	EA			4	4

A8021	VIIG	GENERATOR, DATA, RANDOM AN/CSZ-9	EA			1	1
A8023	VIIG	TRANSFER DEVICE, DATA (DTD) AN/CYZ-10 (V) 3	EA	6	6	20	32
A8024	VIIG	READER, TAPE, GP TSEC/KOI-18	EA	4	5	10	19
A8025	VIIG	TRANSFER DEVICE, ELECTRONIC TSEC/KYK-13	EA	6	6	8	20
A8026	VIIG	CONTROL DEVICE, NET TSEC/KYX-15A	EA	4	3	4	11
A8027	VIIG	POWER SUPPLY, VEHICULAR TSEC/HYP-57	EA	5	1	8	14
A8028	VIIG	ADAPTER, WIRELINE TSEC/HYX-57	EA	7	4	8	19
A8031	VIIG	TSEC/KY-57	EA	17	6	6	29
A8043	VIIG	TSEC/RVQ-57	EA			3	3
A8045	VIIG	MODULE, VOICE, SECURE TSEC/KY (V) 2A	Ea			11	11
A8047	VIIG	TERMINAL, ANDVT/MINTERM TSEC/KY-99A	EA	10	6	20	36
A8050	VIIG	CASE, BATTERY TSEC/ZAIJ	EA	14	17	14	45
A8061	VIIG	KIT, SPARES FOR KY-99A AND RVQ- 99A	KT			3	3
A8064	VIIG	TSEC/KL-51	EA			6	6
A8067	VIIG	TSEC/KWR-46	EA			4	4
A8068	VIIG	TSEC/KGR-96	EA			10	10
A8077	VIIG	TSEC/KL-43C	EA	6	6	11	23
A8078	VIIG	TSEC/RGQ-84C	EA			1	1
A8079	VIIG	TSEC/KY-90	EA			1	1
A8082	VIIG	TSEC/KG-84C	EA			32	32
A8083	VIIG	TSEC/KY-68	EA			13	13
A8084	VIIGP	TSEC/KIV-7	EA			20	20
A8089	VIIG	TSEC/KG-194A	EA			2	2
A8090	VIIG	TSEC/KG-194	EA			2	2
A8096	VIIG	TEST EQUIPMENT, AUTOMATIC, ST-58	EA			1	1
A8100	VIIG	CONTROL GROUP, RADIO OK-648/U	EA	2	2	9	13
A9100	IIB	COMPUTER, GP LAPTOP	EA	2	2	16	20
A9300	IIB	COMPUTER, GP WORKSTATION	EA	14	14	67	95
B0005	VIIB	AIR CONDITIONER, 60HZ, 36K BTU 817005	EA			7	7
B0012	VIIB	AIR CONDITIONER, 60/400 HZ, 18K BTU F18TMPI	EA			13	13

B0013	VIIB	AIR CONDITIONER, 60/400 HZ, 36K BTU (VERT) F36TMPI	EA			7	7
B0579	VIIB	DUMMY LOAD, GENERATOR SET, ELECTRIC, 100KW DE10001	EA			2	2
B0595	VIIB	DISTRIBUTION SYSTEM, POWER, ELECTRIC, 15KW PD015	EA			8	8
BC600	VIIB	DISTRIBUTION SYSTEM, POWER, ELECTRIC, 30KW P0030	EA			4	4
B0605	VIIB	DISTRIBUTION SYSTEM, POWER, ELECTRIC, 100KW P0100	EA			2	2
B0608	VIIB	HARNESS, WIRING, FIELD SM4A30	EA			3	3
B0635	VIIB	FLOODLIGHT SET, W/TOWER SM4A30	EA			2	2
B0891	VIIB	GENERATOR SET, 10KW, 60 HZ, TACT QUIET MEP803A	EA			12	12
B0953	VIIB	GENERATOR SET, 30KW, 60 HZ, TACT QUIET MEP805A	EA			5	5
B1021	VIIB	GENERATOR SET, 60KW, 60 HZ, MEP806A	EA			5	5
B1291	VIIB	DECON SYSTEM, LTWT M1731	EA			2	2
B1580	VIIB	PUMP MODULE, FUEL (SIXCON)	AY			1	1
B1645	VIIB	REFRIG UNIT, ENHANCED FOR RIGID BOX	EA			1	1
B1710	VIIB	REFRIG, RIGID BOX, 350 CU FT	EA			1	1
B2004	VIIB	SKID MOUNTING ASSY, REMOTE, AIR COND TYPE B SMV18	EA			11	11
B2006	VIIB	SKID MOUNTING ASSY, REMOTE, AIR COND TYPE C SMV36	EA			7	7
B2085	VIIB	STORAGE TANK MODULE, FUEL (SIXCON)	AY			2	2
B2130	VIIB	TANK, FABRIC, COLLAPSIBLE,	EA			2	2

		WATER, 3000 GAL					
B2240	IIE	KIT, TOOL, LINEMAN, ELECTRICIAN	KT			3	3
B2280	IIE	KIT, TOOL, SERVICE, REFRIG UNIT	EA			1	1
B2290	IIE	KIT, TOOL, SERVICE, REFRIG UNIT, SUPP	EA			1	1
B2561	VIIB	TRK, FORKLIFT, EXTEND BOOM	EA			1	1
C1055	IIF	CAP, KNIT (WATCH CAP)	EA				573
C1060	IIF	COAT, COLD WEATHER, CAMO, WOODLAND (FLD JCKT)	EA				573
C1091	IIF	DRAWERS, COLD WEATHER, LTWT	EA				1146
C1106	IIF	INSERT, GLOVE, WOOL AND NYLON KNIT, OG	PR				1146
C1107	IIF	GLOVE, SHELL, LEATHER, BLACK	PR				452
C1150	IIF	LINER, COLD WEATHER COAT, NYLON (FOR FLD JCKT)	EA				573
C1250	IIFP	SHIRT, PULLOVER, FLEECE	EA				573
C1261	IIF	UNDERSHIRT, COLD WEATHER, LTWT	EA				1146
C2020	IIF	BAG, WATERPROOFING, PROTECTIVE MASK M1	EA				1146
C2032	VIIA	MONITOR, CHEMICAL AGENT 482-301-B	EA	3	3	3	9
C2075	IIE	KIT, DECON, SKIN M291	BX				23
C2101	IIE	KIT, DETECTOR, CHEMICAL AGENT M256A1	EA	3	3	4	10
C2104	IIEP	DETECTOR, JOINT CHEMICAL AGENT	EA	8	8	14	30
C2105	IIE	DETECTOR, RADIAC DT236/PDR75	EA				573
C2108	VIIBP	DETECTOR, CHEMICAL AGENT, AUTOMATIC M22	EA			1	1
C2110	IIE	DETECTOR, PAPER, CHEMICAL AGENT M9	EA				46
C2130	IIF	COVER, FOOTWEAR,	PR				1146

		PROTECTIVE, CHEMICAL (OVERBOOTS)					
C2150	IIF	GLOVE, PROTECTIVE, CHEMICAL	SE				1146
C2215	IIE	KIT, BOAT SAFETY	KT			5	5
C2284	IIE	KIT, RIGGING, ACFT	KT			3	3
C2285	IIE	KIT, DROP ZONE	KT			3	3
C2300	IIF	SUIT, PROTECTIVE, CHEMICAL (OVERGARMENT)	EA				1146
C3030	IIMP	BAYONET, MULTIPURPOSE M9	EA				573
C3040	IIF	BELT, EQUIPMENT, INDIV, COTTON WEBBING, OD	EA				573
C3060	IIE	CANTEEN, WATER, PLASTIC OD 1QT RIGID	EA				1146
C3070	IIE	CARRIER, TOOL, ENTRENCHING, HAND, FOLDING, LTWT	EA				573
C3115	IID	CASE, AMMO, SML ARMS, 30 RD, FOR RIFLE, M16	EA				900
C3124	IIF	COVER, HELMET, CAMO, WOODLAND	EA				573
C3130	IIF	COVER, CANTEEN, WTER, NYLON, OG	EA				1146
C3140	IIE	CUP, WATER, CANTEEN CRS	EA				573
C3150	IIF	KIT, FIRST AID	EA				573
C3180	IIF	NET, INSECT, HEAD, NYLON, GREEN	EA				573
C3195	IIF	FRAME, FLD PACK	EA				190
C3215	IIE	HELMET, PROTECTIVE, FRAG, PASGT	EA				573
C3230	IIE	TOOL, ENTRENCHING, COMBINATION	EA				573
C3250	IIE	KNIFE, CMBT	EA				130
C3270	IIF	LINER, WET WEATHER, PONCHO	EA				573
C3282	IIE	LOAD BEARING EQUIP SYSTEM 350-506-000	EA			40	40
C3310	IIE	PAD, SLEEPING, COLD WEATHER	EA				573
C3337	IIF	PACK, FLD, MEDIUM	EA				573

C3350	IIE	PIN, ALUMINUM, TENT, SHELTER HALF	EA				2865
C3390	IIE	POLE, SECTION, TENT, SHELTER HALF	EA				1730
C3400	IIF	PONCHO, WET WEATHER, WOODLAND CAMO PATTERN	EA				573
C3410	IIF	SHELTER HALF, TENT, OG	EA				573
C3412	IIF	COMMAND POST SYSTEM, MODULAR, GREEN (MCPS)	EA			12	12
C3413	IIF	TENT SYSTEM, GP, MODULAR (MGPTS)	EA	6	6	15	27
C3414	IIE	TENT, CMBT	EA				287
C3416	IIE	SINGLE ACTION RELEASE PERS EQUIP LOWERING SYSTEM 7006921	EA			57	57
C3421	IIF	BAG, SLEEPING, MODULAR	EA				452
C3423	IIE	STAND, CUP, CANTEEN	EA				573
C3445	IIF	SUSPENDERS, BELT, INDIV EQUIP	EA				130
C3494	IIFP	VEST, FRAGMENTATION, OUTER	EA				573
C3495	IIE	VEST, FRAG PROT, GROUND TROOPS	EA				573
C3498	IIF	VEST, INDIV, LOAD BEARING, TACTICAL	EA				450
C4000	IIE	ACCESSORY OUTFIT, FLD RANGE, GASOLINE	OT			2	2
C4260	IIF	SUPPORT SYSTEM, SCREEN, CAMO	EA			353	353
C4261	IIF	CSS-LTWT, RADAR SCATTER, WOODLAND BLND, W/O SS	EA			318	318
C4262	IIF	CSS-LTWT, RADAR TRANSPARENT, WOODLAND W/O SS	EA			36	36
C4263	IIE	CSS-LTWT, R S DESERT W/O SS 170560	EA			318	318
C4264	IIE	CSS-LTWT, R T DESERT W/O SS 13226E1357	EA			36	36
C4320	IIE	CASE,	EA			57	57

		PARACHUTISTS, INDIV WPN, COTTON, OD					
C4431	IIE	CONTAINER, PALLET 102440	EA	15	15	20	50
C4433	IIE	BOX, SHIPPING 138K0000	EA	5	5	10	20
C4545	IIE	DISPENSER, BEVERAGE, 5 GAL LIQUID 500LCD-G	EA			6	6
C4548	VIIBP	PROPULSION SYSTEM, SMALL CRAFT	EA			5	5
C4870	IIF	TENT, FLY, STORAGE	EA			15	15
C4880	IIE	CONTAINER, FOOD, INSULATED	EA			5	5
C4901	IIE	FRAME A, ADJ, 5TON, 5T2025SS	EA			1	1
C4950	IIT	GRINDING MACHINE, UTIL,	EA			2	2
C4977	IIF	HARNESS ASSY, INS/EXT/SPL PATROL	EA			38	38
C4980	IIE	HEATER, IMMERSION, LIQUID FUEL FIRED M67	EA			5	5
C4993	IIFP	HELMET, CVC, ADVANCED	EA	30			30
C5020	IIT	HOIST, CHAIN, SPUR GEAR, 4K LB	EA			1	1
C5080	IIT	JACK, DOLLY, TYPE 10	EA			3	3
C5262	IIB	RECON SYSTEM, AMPHIB, MILITARY, IMPROVED	EA			10	10
C5265	IIE	MASK, CHEM-BIO, PROT M40	EA				573
C5266	IE	MASK, CHEM-BIO, PROT, CV M42	BX			18	18
C5268	IIEP	TEST SET, EVAL, MASK, PROT M41	EA			1	1
C5430	IIFP	MARINE LOAD SYSTEM, RIFLEMAN SET	EA				350
C5431	IIFP	MARINE LOAD SYSTEM, PISTOLMAN SET	EA				100
C5434	IIF	MARINE LOAD SYSTEM, COMBAT MEDIC SET	EA				6
C5590	IIF	PARACHUTE, PERSONNEL, MCI-1C	EA			57	57

C5600	IIF	PARACHUTE, RESERVE, PERSONNEL, TROOP, CHEST	EA			57	57
C5652	IIF	PARKA, EXTD COLD WEATHER, CAMO, 2D GENERATION	EA				573
C5820	IIE	RANGE OUTFIT, FLD, GASOLINE, B PACK M1959	EA			4	4
C5901	VIIK	RAIDING CRAFT, CMBT, RUBBER, INFLATABLE (CRRC) F470	EA			5	5
C5905	IIF	ROPE ASSY, SPIE	EA			7	7
C5920	IIE	SAFE, EXPLOSIVE RESISTANT	EA			1	1
C6030	IIE	SEAL, HAND, IMPRESSION (OFFICIAL USMC SEAL)	EA			1	1
C6102	IIT	SEWING MACHINE, GENERAL, MEDIUM DUTY 255RB1	EA			2	2
C6155	IIF	BAG, SLEEPING, BIVY SACK	EA				573
C6388	IIF	TARPAULIN, 26' X 22'	EA			4	4
C6400	IIF	TENT, FRAME TYPE, MAINT, MEDIUM	EA			2	2
C6420	IIF	TENT, SHELTER, MAINT	EA			3	3
C6560	IIT	KIT, TOOL, PARA LOFT, SET A	SE		2		2
C6630	IIT	TROLLEY, I-BEAM	EA			1	1
C6650	IIT	TRK, LIFT, WHEEL	EA			2	2
C7036	IIT	KIT, TOOL, MECHANIC'S	KT			20	20
C7040	VIIG	ANALYZER SET, ENGINE STE/ICE-R 12259266	SE			2	2
C7073	IIB	TOOL SET, COMMON NO. 1, OM, 2D ECHELON	SE			1	1
C7920	IIBP	DIAG SYSTEM, AUTOMATED, VEHICLE	EA			3	3
C8638	VIII	AMAL 635, AID STATION EQUIP	EA			1	1
C8640	VIII	AMAL 636, AID STATION CONSUMABLES	EA			1	1
D0080	VIIK	CHASSIS, TRLR, GP, 3 1/2T, 2- WHL M353	EA			12	12

D0085	VIIK	CHASSIS, TRLR, 3/4T, 2-WHL M116A3	EA			7	7
D0100	IIE	DEGREASER, PORTABLE, 20 GAL CAP.	EA			1	1
D0190	VIIK	LUBRICATING AND SERVICING UNIT POWER OPERATED 4A032-11	EA			1	1
D0198	VIIKP	TRK, CARGO, 7T, W/WINCH (MTVR) MK25	EA	5	10	10	25
D0475	IIE	KIT, TOOL, OM, 2D ECH, HMMWV	EA			3	3
D0755	IIE	KIT, TOOL, OM, 2D/3D ECH, FOR TRK, 5T M809/ M939	EA			1	1
D0850	VIIK	TRLR, CARGO, 3/4T, 2-WHL M101A3	EA	2	1	2	5
D0860	VIIK	TRLR, CARGO, 1 1/2T, 2-WHL M105A2	EA			3	3
D0880	VIIK	TRLR, TANK, WATER, 400 GAL, 1 1/2T, 2-WHL M149A2	EA			3	3
D1002	VIIK	TRK, AMBUL, 2- LTR, SOFT TOP, 2 1/4T, HMMWV M1035A2	EA			1	1
D1059	VIIK	TRK, CARGO, 5T, 6X6, W/O WINCH M923A1	EA	3	3	18	24
D1158	VIIK	TRK, UTIL, CARGO/TRP CARR, 1 1/4 T, W/EQP, HMMWV M1123	EA	12	4	12	28
D1212	VIIK	TRK, WRECKER, 5T, 6X6 M936	EA			1	1
E0050	IIE	BAYONET-KNIFE, W/SCABBARD M7	EA				350
E0950	VIIB	LAV, MAINT/RECOVERY LAV-R	EA			1	1
E0955	VIIB	LIGHT, AIMING, INFRARED AN/PAQ- 4C	EA			23	23
E0961	VIIM	MACHINE GUN, 7.62MM M240E1	EA	6			6
E0980	VIIM	MACHINE GUN, CAL .50, BROWNING, HB FLEX M2	EA			2	2
E0989	VIIM	MACHINE GUN, MEDIUM, 7.62MM,	EA	1	1	2	4

		GROUND VERSION M240G					
E0994	VIIM	MACHINE GUN, 40MM MK19 MOD3	EA			2	2
E1096	VIIM	MOUNT, MACHINE GUN, FLEXIBLE	EA	6			6
E1115	IIBP	MOUNT, TRIPOD, HEAVY MACHINE GUN (LTWT) MK123	EA			4	4
E1120	IIB	MOUNT, TRIPOD, MG, 7.62MM M122	EA	1	1	2	4
E1121	IIB	MOUNT, TRIPOD, MACHINE GUN, LTWT MK125	EA	6			6
E1123	IIB	MOUNT, STANDARD CONFIGURATION MK64 MOD5	EA			2	2
E1126	IIB	MOUNT, TRIPOD, MACHINE GUN M3	EA			4	4
E1152	IIB	GOGGLES, NIGHT VISION, INDIV AN/PVS-7B	EA	27	23	50	100
E1159	IIB	SIGHT, NIGHT VISION, WEAPON, CREW SERVED AN/TVS-5A	EA			1	1
E1250	IIM	PISTOL, 9MM M9	EA				130
E1441	IIM	RIFLE (IMPROVED), 5.56MM M16A2	EA				450
E1834	IIEP	STAND, GROUND HOP, POWER PACK, FOR LAV	EA			1	1
E1948	VIIG	TEST SET, ELECTRONIC SYSTEMS TS4348/UV	EA			2	2
E2658	IIE	KIT, TOOL, IM, LAV-25, 3D ECH	EA			1	1
E2660	IIE	KIT, TOOL, OM, LAV-25, 2D ECH	EA			2	2
E2829	IIE	KIT, TOOL, OM, FOR M240G	EA			1	1
E2900	IIE	KIT, TOOL, SMALL ARMS, REPAIRMAN'S	SE			2	2
E3094	IIB	TOOL SET, OM, FOR 40MM MG MK19 MOD3	SE			1	1

NOTE: This Table of Equipment does not include those items that are HOTEL, JULIET, KILO and MIKE TAM control numbered and which list their quantity "AS REQUIRED."

ASSUMPTIONS This Table of Equipment has been drafted based on the following assumptions:

- (1) The previously drafted T/O of 25/427 serves as the basis for this T/E
- (2) The number of augmentees to be equipped by this T/E are 13/108 per current structure shortages identified by the 1999 Force Structure Planning Group
- (3) The number of augmentee rifles is 100; the number of augmentee pistols is 30.

APPENDIX C. RELOCATION OF PERSONNEL (OFFICERS/ENLISTED)

The spreadsheet report in this appendix is the input data for the Microsoft Excel CRYSTAL BALL simulation and final report. The report summarizes the results and statistics for the simulation run (shown below and discussed in Chapter 4) to provide a probabilistic cost estimate for the permanent change of station (PCS) transfer of officers and enlisted Marines from Hawaii to Camp Pendleton in FY 2004.

COST ESTIMATE SIMULATION: PERSONNEL

Crystal Ball Report

Simulation started on 11/23/00 at 13:16:43

Simulation stopped on 11/23/00 at 13:17:05

Forecast: TOTAL COST

Summary:

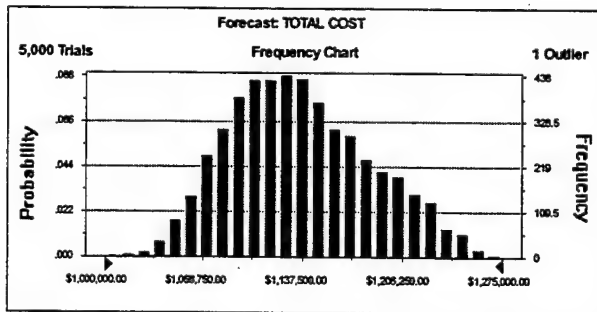
Display Range is from \$1,000,000.00 to \$1,275,000.00

Entire Range is from \$1,015,915.26 to \$1,275,802.39

After 5,000 Trials, the Std. Error of the Mean is \$683.23

Statistics:

	Value
Trials	5000
Mean	\$1,135,725.39
Median	\$1,131,377.68
Mode	—
Standard Deviation	\$48,311.99
Variance	#####
Skewness	0.30
Kurtosis	2.49
Coeff. of Variability	0.04
Range Minimum	\$1,015,915.26
Range Maximum	\$1,275,802.39
Range Width	\$259,887.14
Mean Std. Error	\$683.23



Forecast: TOTAL COST (cont'd)

Percentiles:

<u>Percentile</u>	<u>Value</u>
0%	\$1,015,915.26
5%	\$1,063,518.69
10%	\$1,075,225.69
15%	\$1,084,872.17
20%	\$1,092,569.53
25%	\$1,099,532.73
30%	\$1,106,108.98
35%	\$1,112,062.55
40%	\$1,118,584.26
45%	\$1,125,090.92
50%	\$1,131,377.68
55%	\$1,137,863.52
60%	\$1,144,219.35
65%	\$1,151,393.90
70%	\$1,160,210.40
75%	\$1,169,433.27
80%	\$1,178,712.12
85%	\$1,190,945.12
90%	\$1,205,352.35
95%	\$1,222,238.36
100%	\$1,275,802.39

Frequency Counts:

Frequency:

<u>Group</u>	<u>Start Value</u>	<u>End Value</u>
	-Infinity	\$1,000,000.00
1	\$1,000,000.00	\$1,011,000.00
2	\$1,011,000.00	\$1,022,000.00
3	\$1,022,000.00	\$1,033,000.00
4	\$1,033,000.00	\$1,044,000.00
5	\$1,044,000.00	\$1,055,000.00
6	\$1,055,000.00	\$1,066,000.00
7	\$1,066,000.00	\$1,077,000.00
8	\$1,077,000.00	\$1,088,000.00
9	\$1,088,000.00	\$1,099,000.00
10	\$1,099,000.00	\$1,110,000.00
11	\$1,110,000.00	\$1,121,000.00
12	\$1,121,000.00	\$1,132,000.00
13	\$1,132,000.00	\$1,143,000.00
14	\$1,143,000.00	\$1,154,000.00

Forecast: TOTAL COST (cont'd)

<u>Group</u>	<u>Start Value</u>	<u>End Value</u>
15	\$1,154,000.00	\$1,165,000.00
16	\$1,165,000.00	\$1,176,000.00
17	\$1,176,000.00	\$1,187,000.00
18	\$1,187,000.00	\$1,198,000.00
19	\$1,198,000.00	\$1,209,000.00
20	\$1,209,000.00	\$1,220,000.00
21	\$1,220,000.00	\$1,231,000.00
22	\$1,231,000.00	\$1,242,000.00
23	\$1,242,000.00	\$1,253,000.00
24	\$1,253,000.00	\$1,264,000.00
25	\$1,264,000.00	\$1,275,000.00
	\$1,275,000.00	+Infinity

Total:

Cumulative:

<u>Group</u>	<u>Start Value</u>	<u>End Value</u>
	-Infinity	\$1,000,000.00
1	\$1,000,000.00	\$1,011,000.00
2	\$1,011,000.00	\$1,022,000.00
3	\$1,022,000.00	\$1,033,000.00
4	\$1,033,000.00	\$1,044,000.00
5	\$1,044,000.00	\$1,055,000.00
6	\$1,055,000.00	\$1,066,000.00
7	\$1,066,000.00	\$1,077,000.00
8	\$1,077,000.00	\$1,088,000.00
9	\$1,088,000.00	\$1,099,000.00
10	\$1,099,000.00	\$1,110,000.00
11	\$1,110,000.00	\$1,121,000.00
12	\$1,121,000.00	\$1,132,000.00
13	\$1,132,000.00	\$1,143,000.00
14	\$1,143,000.00	\$1,154,000.00
15	\$1,154,000.00	\$1,165,000.00
16	\$1,165,000.00	\$1,176,000.00
17	\$1,176,000.00	\$1,187,000.00
18	\$1,187,000.00	\$1,198,000.00
19	\$1,198,000.00	\$1,209,000.00
20	\$1,209,000.00	\$1,220,000.00
21	\$1,220,000.00	\$1,231,000.00
22	\$1,231,000.00	\$1,242,000.00
23	\$1,242,000.00	\$1,253,000.00
24	\$1,253,000.00	\$1,264,000.00
25	\$1,264,000.00	\$1,275,000.00

Forecast: TOTAL COST (cont'd)

Group Start Value
 \$1,275,000.00

End Value
 +Infinity

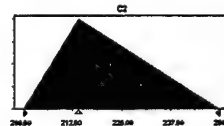
End of Forecast

Assumptions

Assumption: C2

Triangular distribution with parameters:

Minimum	200.00
Likeliest	214.00
Maximum	250.00

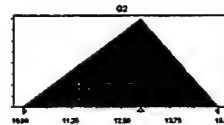


Selected range is from 200.00 to 250.00
 Mean value in simulation was 221.40

Assumption: G2

Triangular distribution with parameters:

Minimum	10.00
Likeliest	13.00
Maximum	15.00



Selected range is from 10.00 to 15.00
 Mean value in simulation was 12.69

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APPENDIX D. SHIPPING AND TRANSPORTATION OF VEHICLES

The spreadsheet reports seen in Appendix C dealt solely with personnel PCS transfers to the mainland. This appendix contains the simulation spreadsheet reports for moving vehicles. Specifically, the cost simulations highlighted in this appendix include shipping and transportation costs for vehicles using rates from the current fiscal year. These results will be adjusted to CY04 dollars in Chapter 4.

COST ESTIMATE SIMULATION: VEHICLES

Crystal Ball Report

Simulation started on 11/23/00 at 13:31:06

Simulation stopped on 11/23/00 at 13:31:23

Forecast: TOTAL COST

Summary:

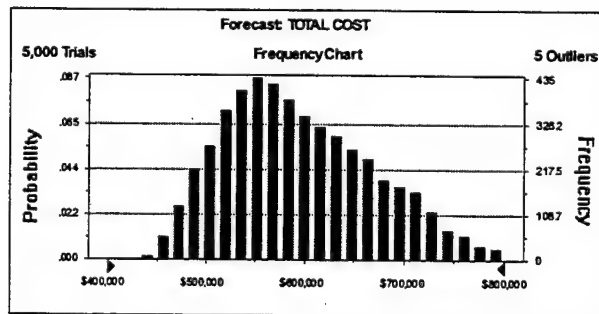
Display Range is from \$400,000 to \$800,000

Entire Range is from \$420,007 to \$822,313

After 5,000 Trials, the Std. Error of the Mean is \$1,058

Statistics:

	<u>Value</u>
Trials	5000
Mean	\$593,752
Median	\$584,291
Mode	—
Standard Deviation	\$74,823
Variance	\$5,598,476,520
Skewness	0.41
Kurtosis	2.50
Coeff. of Variability	0.13
Range Minimum	\$420,007
Range Maximum	\$822,313
Range Width	\$402,305
Mean Std. Error	\$1,058.16



Forecast: TOTAL COST (cont'd)

Percentiles:

<u>Percentile</u>	<u>Value</u>
0%	\$420,007
5%	\$485,395
10%	\$501,748
15%	\$515,000
20%	\$525,715
25%	\$536,457
30%	\$546,033
35%	\$555,085
40%	\$564,426
45%	\$573,812
50%	\$584,291
55%	\$595,119
60%	\$606,651
65%	\$619,282
70%	\$631,247
75%	\$645,792
80%	\$661,703
85%	\$679,468
90%	\$701,381
95%	\$728,646
100%	\$822,313

Frequency Counts:

Frequency:

<u>Group</u>	<u>Start Value</u>	<u>End Value</u>
	-Infinity	\$400,000
1	\$400,000	\$416,000
2	\$416,000	\$432,000
3	\$432,000	\$448,000
4	\$448,000	\$464,000
5	\$464,000	\$480,000
6	\$480,000	\$496,000
7	\$496,000	\$512,000
8	\$512,000	\$528,000
9	\$528,000	\$544,000
10	\$544,000	\$560,000
11	\$560,000	\$576,000
12	\$576,000	\$592,000
13	\$592,000	\$608,000
14	\$608,000	\$624,000

Forecast: TOTAL COST (cont'd)

<u>Group</u>	<u>Start Value</u>	<u>End Value</u>
15	\$624,000	\$640,000
16	\$640,000	\$656,000
17	\$656,000	\$672,000
18	\$672,000	\$688,000
19	\$688,000	\$704,000
20	\$704,000	\$720,000
21	\$720,000	\$736,000
22	\$736,000	\$752,000
23	\$752,000	\$768,000
24	\$768,000	\$784,000
25	\$784,000	\$800,000
	\$800,000	+Infinity
Total:		

Cumulative:

<u>Group</u>	<u>Start Value</u>	<u>End Value</u>
	-Infinity	\$400,000
1	\$400,000	\$416,000
2	\$416,000	\$432,000
3	\$432,000	\$448,000
4	\$448,000	\$464,000
5	\$464,000	\$480,000
6	\$480,000	\$496,000
7	\$496,000	\$512,000
8	\$512,000	\$528,000
9	\$528,000	\$544,000
10	\$544,000	\$560,000
11	\$560,000	\$576,000
12	\$576,000	\$592,000
13	\$592,000	\$608,000
14	\$608,000	\$624,000
15	\$624,000	\$640,000
16	\$640,000	\$656,000
17	\$656,000	\$672,000
18	\$672,000	\$688,000
19	\$688,000	\$704,000
20	\$704,000	\$720,000
21	\$720,000	\$736,000
22	\$736,000	\$752,000
23	\$752,000	\$768,000
24	\$768,000	\$784,000
25	\$784,000	\$800,000

Forecast: TOTAL COST (cont'd)

Group Start Value
\$800,000

End Value
+Infinity

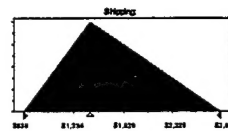
End of Forecast

Assumptions

Assumption: Shipping:

Triangular distribution with parameters:

Minimum	\$838
Likeliest	\$1,500
Maximum	\$2,820

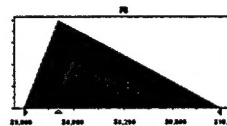


Selected range is from \$838 to \$2,820
Mean value in simulation was \$1,722

Assumption: F8

Triangular distribution with parameters:

Minimum	\$5,600
Likeliest	\$6,506
Maximum	\$10,800

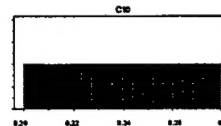


Selected range is from \$5,600 to \$10,800
Mean value in simulation was \$7,642

Assumption: C10

Uniform distribution with parameters:

Minimum	0.20
Maximum	0.27



Mean value in simulation was 0.23

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